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Descriptions of two new species of *Pisenus* Casey, 1900 from Shaanxi and Sichuan, China (Coleoptera: Tetratomidae: Piseninae)

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Abstract: Two new species of the genus *Pisenus* Casey, 1900 (Coleoptera: Tetratomidae) are described from China: *Pisenus qizai* **sp. nov.** (type locality: Foping, Shaanxi Province) and *Pisenus atrox* **sp. nov.** (type locality: Maoxian, Sichuan Province). This represents the first definitive record of the subfamily Piseninae from the Chinese mainland.

Keywords: China, new species, polypore fungus beetles, taxonomy

中国陕西省与四川省皮蕈甲属 *Pisenus* 两新种记述（鞘翅目：斑蕈甲科：皮蕈甲亚科）

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摘要：本文描述皮蕈甲属 *Pisenus*（鞘翅目 Coleoptera，斑蕈甲科 Tetratomidae）两新种：七仔皮蕈甲 *Pisenus qizai* **sp. nov.**（模式产地：陕西省佛坪县）与黑魔皮蕈甲 *Pisenus atrox* **sp. nov.**（模式产地：四川省茂县）。此为中国大陆地区皮蕈甲亚科 Piseninae 首次明确的分布记录。

关键词：中国，新种，斑蕈甲，分类学

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Introduction

Piseninae Miyatake, 1960 is one of the five subfamilies of the family Tetratomidae, as classified by Nikitsky (1998). This small subfamily comprises four genera and ten species globally (Nikitsky 2004; Háva & Alekseev 2024): *Pisenus* Casey, 1900 (6 species worldwide, with 4 species from East Asia and 2 species from North America), *Triphyllia* Reitter, 1898 (2 species from North America and the Caucasus region), *Notopisenus* Nikitsky & Lawrence, 1992 (1 species from Chile), and *Allenus* Háva & Alekseev, 2024 (1 species from Vietnam).

In East Asia, the subfamily Piseninae has been recorded from Liaoning and Taiwan Provinces of China, as well as several neighboring countries (Miyatake 1972; Li 1992; Nikitsky 1998). However, the record from Liaoning is dubious (see discussion under *Pisenus chujoi* for details). Thus, prior to the present study, this subfamily had no definitive records from the Chinese mainland. Recently, two undescribed species of *Pisenus* were collected by the authors in Shaanxi and Sichuan provinces. Following detailed morphological studies and comparisons with all known East Asian congeners, these two taxa are considered to be most similar to *P. formosanus* Miyatake, 1974 and *P. rufitarsis* (Reitter, 1889), respectively, while exhibiting distinct diagnostic differences that distinguish them from all previously described species.

In the present study, these two new species are amply described and illustrated, accompanied by a key to all Asian species of *Pisenus*. The descriptions of the new species not only extend the known distribution range of Piseninae in East Asia, but also provide, for the first time, high-resolution illustrations of the habitus, male and female genitalia, and larvae of this subfamily.

Material and methods

The specimens examined in this study were deposited in the Collection of Forest Entomology Laboratory, Beijing Forestry University, Beijing, China (CBFU).

Measurements and abbreviations are as follows: the length of body (BL) was the linear distance from the apex of labrum to elytral sutural end; the width of head (HW) was measured along the outer margin of eyes; the length of pronotum (PL) was measured along median line; the width of pronotum (PW) was measured across maximum width of pronotum; the length of elytra (EL) was measured from elytral base to sutural apex; the width of elytra (EW) was measured across maximum width of closed elytra; the length of tegmen was measured from tegminal struts to the apices of accessory lobes. A1–A11 were abbreviated for antennomeres 1–11.

The terminologies for male genitalia adopted here are based on those presented in Lawrence & Ślipiński (2013). Other morphological terms generally adhere to their common usages within the subfamily Piseninae (Miyatake 1960; Nikitsky 1998). All images of habitus, external and male genitalia characters were taken by a Nikon SMZ-18 stereoscopic dissecting microscope fitted with a Nikon D7500 camera. For each final image, several photographs were taken at different focal planes and combined with Helicon Focus software to get one synthesized photograph.

Taxonomy

Pisenus Casey, 1900 皮蕈甲属

Pisenus Casey, 1900: 172; Miyatake 1960: 126; Nikitsky 1998: 27; Nikitsky 2004: 6.

Type species: *Cryptophagus humeralis* Kirby, 1837, by subsequent designation of Nikitsky 1998: 27.

Diagnostic characters. Species of the genus are small to medium-sized (BL = 2.5–6.2 mm), slightly elongate and compact beetles; dorsum more or less pubescent and punctate, elytra punctures not arranged in rows; dorsal surface dark colored, elytra with bicolored pattern in some species; antennae capitate, with 3-segmented loose club; A3 longest, at least 1.5 times as long as A2; antennal insertions in front of eyes, partly concealed from above by frontal ridges; fronto-clypeal suture nearly semicircular; tarsi 5-5-4 in both sexes, slender without tarsal pad or lobed

tarsomere; abdominal ventrite 1 distinctly longer than ventrite 2; male genitalia with short and wide parameres, articulated to phallobase; a pair of large tegminal accessory lobes inserted apical to phallobase, with several tubercles and setae on them; phallobase with a wide ventral lobe and a pair of dorsolateral lobes; tegminal struts paired, short and wide (Fig. 3D).

Recognition of the genus. The subfamily Piseninae Miyatake can be readily distinguished from other subfamilies of Tetratomidae by its 3-segmented antennal club. All other members of the family either lack a distinct antennal club or have a club composed of four or more antennomeres. Compared with other genera in the subfamily Piseninae, *Pisenus* is characterized by the presence of paired accessory lobes on the tegmen. Externally, *Pisenus* differs from *Notopisenus* Nikitsky & Lawrence in having a nearly symmetrical antennal club, and from *Triphyllia* Reitter in that the lateral margins of the pronotum are not flattened and abdominal ventrite 1 is considerably longer than ventrite 2. The last genus of the subfamily, *Allenus* Háva & Alekseev, was established primarily on its differences from *Pisenus*, including the more loose antennal club and pronotum with protuberances. However, we consider the validity of *Allenus* highly questionable; see the detailed comparison for *P. atrox* **sp. nov.** below.

Within the superfamily Tenebrionoidea, the overall habitus of *Pisenus* is comparable only to that of the families Mycetophagidae and Ciidae, but it can be easily distinguished by the tarsal formula: *Pisenus* has tarsi 5-5-4, whereas the latter two families have tarsi 4-4-4, 3-4-4, or rarely 3-3-3.

Diversity and distribution. The genus comprises eight species worldwide (including the present two new species), with two from North America and six from East Asia.

Habitat. Adults and larvae of *Pisenus* species are associated with the fruiting bodies of wood-rotting fungi. Host fungi for four species of the beetle (*P. humeralis*, *P. rufitarsis*, *P. chujoi*, and *P. insignis*) have been recorded in previous studies (Miyatake 1960; Nikitsky 2004; Jung 2011). Most of these host fungi are polypores, belonging to the following families and genera: Polyporaceae (*Trametes*, *Daedaleopsis*), Fomitopsidaceae (*Ischnoderma*, *Laetiporus*, *Fomitopsis*), Laetiporaceae (*Laetiporus*), Incrustoporiaceae (*Tyromyces*), and Bondarzewiaceae (*Heterobasidion*). Additionally, two genera of the true mushrooms (*Hypholoma*, *Pleurotus*) have been recorded as host fungi for *P. insignis*. The two new species described in the present study were all collected in the fruiting bodies of *Trametes* (Polyporaceae).

Key to the Asian species of *Pisenus* Casey

1 Dorsum entirely black; penis apex capitate, not narrowed medially.....**2**

- Elytra predominantly brown or with bicolored pattern; penis apex not capitate, or distinctly narrowed medially.....**3**

2 Larger species (BL = 5.0–6.2 mm); males with distinct sexual modifications on head and pronotum; antennae shorter, apical one or two segments exceeding pronotal posterior margin, A5–A8 not longer than width. China (Sichuan).....***P. atrox* sp. nov.**

- Smaller species (BL = 4.0–5.0 mm); without sexual modifications on head and pronotum; antennae longer, at least apical three segments exceeding pronotal base, A5–A8 distinctly longer than width. Russia (Far East), Japan.....***P. rufitarsis*** (Reitter, 1889)

3 Dorsum covered with semi-erected pubescence; A3 only slightly longer than A2; penis in similar length as tegmen, apex capitate, distinctly narrowed medially. Russia (Far East), South Korea, Japan.....
.....***P. insignis*** (Reitter, 1889)

- Dorsum covered with decumbent pubescence; A3 1.5–2.0 times as long as A2; penis 1.6–1.8 times as long as tegmen, apex not capitate, not narrowed medially.....**4**

4 Elytra with bicolored pattern, laterally reddish brown, with an indefinite and broad longitudinal black band along suture; pronotum with relatively fine punctures, average distance between punctures subequal or more than diameter of punctures; accessory lobes of tegmen larger, a little greater than half length of tegmen (measures from tegminal struts to parameres), phallobase distinctly narrowed anteriorly. Russia (Far East), Japan.....***P. chujoi*** Miyatake, 1960

- Elytra without distinct pattern, predominantly reddish brown or dark brown, often obscurely black along suture; pronotum with very coarse punctures, average distance between punctures less than half diameter of punctures; accessory lobes of tegmen smaller, less than half length of tegmen, phallobase laterally parallel.....**5**

5 Smaller species (BL = 3.0–4.0 mm); dorsum predominantly dark brown; accessory lobes of tegmen narrowly rounded apically, with 4–7 tubercles on dorsal surface. China (Taiwan).....***P. formosanus*** Miyatake, 1974

- Larger species (BL = 4.1–4.8 mm); dorsum predominantly reddish brown; accessory lobes of tegmen widely rounded apically, with 15–20 tubercles on dorsal surface. China (Shaanxi).....***P. qizai* sp. nov.**

Pisenus qizai sp. nov. 七仔皮蕈甲

https://zoobank.org/4454359D-927C-493F-B750-BE853AD8F4FA

Figs 1–3, 4E, 4F

Type material. Holotype ♂, "Shaanxi, Hanzhong, Foping National Reserve, way between Daguping Station to Sanguanmiao; in rotten fungi on dead wood; 1380 m, N33.6201, E107.7886; YANG G.Y. & SHI H.L. lgt.; 2025.V.02" [in Chinese]. **Paratypes** 21 ♂♀, same data as holotype.

Diagnostic characters. Relatively large species within *Pisenus*, BL = 4.1–4.8 mm; dorsum predominantly reddish brown, elytra without distinct pattern; dorsum covered with long decumbent pubescence; without sexual dimorphism; antennae slightly exceeding base of pronotum, A6–A8 moniliform, length not exceeding their width; pronotum very coarsely punctate, average distance between punctures less than half diameter of punctures; tegmen with large accessory lobes, approximately half length of tegmen, each accessory lobe with 15–20 tubercles; penis 1.6–1.7 times as long as tegmen, apex not capitate.

Comparison. The new species is most similar to *P. formosanus* Miyatake, sharing the following characteristics: dorsum predominantly brown, with elytra lacking distinct pattern; pronotum with very dense and coarse punctures; A3 distinctly longer than A2, A5 not shorter than A4; penis distinctly longer than tegmen, apex not capitate. These two species can be distinguished by the following aspects: (1) Body size is slightly larger in *P. qizai* **sp. nov.** (BL = 4.1–4.8 mm); versus smaller in *P. formosanus* (BL = 3.0–4.0 mm). (2) Dorsal color is lighter in *P. qizai* **sp. nov.**, with the elytra predominantly reddish brown; versus the elytra are dark brown in *P. formosanus*. (3) *P. qizai* **sp. nov.** has a slightly more elongate body form, with the lateral margins of elytra nearly parallel; in contrast, *P. formosanus* has a slightly stouter body form, with the elytra distinctly expanded near the mid-length. (4) In *P. qizai* **sp. nov.**, the tegminal accessory lobes are slightly larger and wider, with broadly rounded apices, and each lobe bears 15–20 tubercles on the dorsal surface; whereas, in *P. formosanus*, the tegminal accessory lobes are slightly smaller and narrower, with narrowly rounded apices, and each lobe has only 4–7 tubercles.

The new species is also similar to *P. chujoi* Miyatake, 1960, particularly in the antennal and male genital morphologies. These two species are different in the following aspects: (1) The elytra of *P. qizai* **sp. nov.** lack distinct pattern; whereas those of *P. chujoi* exhibit a distinct bicolored pattern consisting of reddish brown and black. (2) Body size is slightly larger in *P. qizai* **sp. nov.** (BL = 4.1–4.8 mm) compared to *P. chujoi* (BL = 3.5–4.0 mm). (3) in *P. qizai* **sp. nov.**, the pronotal punctures are much coarser than that on the head; in contrast, the pronotal punctures of *P. chujoi* are finer or comparable in size to that on the head. (4) The extreme apex of the penis in *P. qizai* **sp. nov.** is somewhat abruptly narrowed, forming a more projecting apex; in *P. chujoi*, the extreme apex of the penis tapers gradually, forming a broad triangular apex. (5) The tegmen of *P. qizai* **sp. nov.** also differs slightly from that of *P. chujoi*: the phallobase is almost entirely laterally parallel, the parameres are slightly longer with more acute apices,

and the apices of the accessory lobes are more rounded.

The dorsal coloration of the new species is also similar to that of the brown individuals of *P. insignis* (Reitter, 1889). However, their male genitalia differ markedly. In *P. insignis*, the tegminal accessory lobes are very narrow, and the penis is not longer than the tegmen. The new species can also be distinguished from *P. insignis* by the following external morphological characters: In *P. qizai* **sp. nov.**, A3 is approximately 1.6 times as long as A2; in *P. insignis*, A3 is only slightly longer than A2. In *P. qizai* **sp. nov.**, the pronotal punctures are coarser than those on the elytra; in *P. insignis*, the elytral punctures are coarser than those on the pronotum. In *P. qizai* **sp. nov.**, the dorsum is covered with decumbent pubescence; in *P. insignis*, the pubescence is semi-erect. Body size of *P. qizai* **sp. nov.** is considerably larger than *P. insignis* (BL = 2.5–3.5 mm).

Description. BL = 4.1–4.8 mm, elytra slightly convex, without external differences between males and females, habitus as Fig. 1A. Dorsum predominantly reddish brown, usually darker on clypeus, area close to pronotal basal margin, scutellum and elytral suture; antennae and legs dark brown; palpomeres reddish brown; ventral surface dark brown, abdominal sternum lighter. Dorsum densely punctate; punctures very coarse on pronotum (Fig. 4E), without sparse region at middle, average distance between punctures less than half diameter of punctures; punctures finer on elytra (Fig. 4F), on basal region, average distance between punctures about same as diameter of punctures. Each puncture bearing a relatively long, thick golden pubescence, which partly abraded in some of the examined specimens; pubescence decumbent, in similar length all through body, on middle part of elytra, length of pubescence more than twice length distance between punctures (Fig. 4E, F).

Head relatively small, much narrower than pronotum, HW/PW = 0.64–0.69. Eyes flat kidney-shaped, emarginate behind antennal insertion, coarsely faceted; fronto-clypeal suture almost semicircular, distinctly impressed (Fig. 1C); vertex simple in both sexes. Antennae relatively short, only apical one antennomere exceeding pronotal basal margin, apical three antennomeres strongly dilated, forming loose club; A2, A4, and A5 similar in length and shape, slightly longer than their width; A3 about 1.6 times as long as A2; A6–A8 globular, not longer than their width; A9 and A10 hemispherical, A10 slightly shorter than A9, both with hairy apical surface and forming a sensilla region; A11 oblate spheroid, with wide apical sensilla region (Fig. 2A–C).

Pronotum nearly quadrate, PW/PL = 1.52–1.60; anterior margin straight at middle; lateral margins nearly straight behind anterior third, equal in width or weakly narrowed posteriorly, widest point behind middle; anterior angles very wide, not projected at all; posterior angles narrowly rounded; posterior margin strongly bisinuate, distinctly bordered between two latero-basal depressions; latero-basal depressions shallow but distinct, forming short triangular incisions.

Elytra relatively short, EL/EW = 1.53–1.58, lateral margins nearly parallel, widest a little behind mid-point. Hind wings as in Fig. 1E. Ventral surface densely punctate, pubescence evenly long from prosternum to abdominal sternum; anterior margin of mesoventrite with median notch and elevated border receiving slightly projected prosternal process; mesocoxae narrowly separated by mesoventrite and metaventrite; abdominal sternite III (ventrite 1) slightly shorter than the combined length of succeeding two segments; elytral epipleuron gradually narrowed to apex, ended near sternite IV. Tibiae narrow, apex with two spurs on all legs; tarsi 5-5-4, tarsomeres simple, terminal tarsomere similar as the combined length of preceding three ones (Fig. 2D–F).

Male terminalia (Fig. 3): sternite VIII shallowly emarginate apically; tergite VIII narrowly rounded apically. Tegmen short and wide; parameres apically setose, articulated to phallobase, very short and wide, about one-third length of phallobase, partly fused to each, distinctly notched between two parameres; main body of phallobase sheath-shaped, posterior (apical) edge lobed, with a widely rounded lingulate ventral lobe and a pair of slightly projected dorsolateral lobes; a pair of accessory lobes inserted basally to dorsal surface of ventral lobe; accessory lobes large and wide, nearly twice length of parameres, approximately 0.45 times as long as tegmen, apex widely rounded, with very long setae, lateral margins evenly narrowed from subapex to base, dorsal surface of accessory lobes with 15–20 stout tubercles (Fig. 3D). Penis 1.6–1.7 times as long as tegmen, apical fourth bent to dorsum; apex not capitate, somewhat abruptly attenuate before apex, forming a narrowly pointed extreme apex (Fig. 3G).

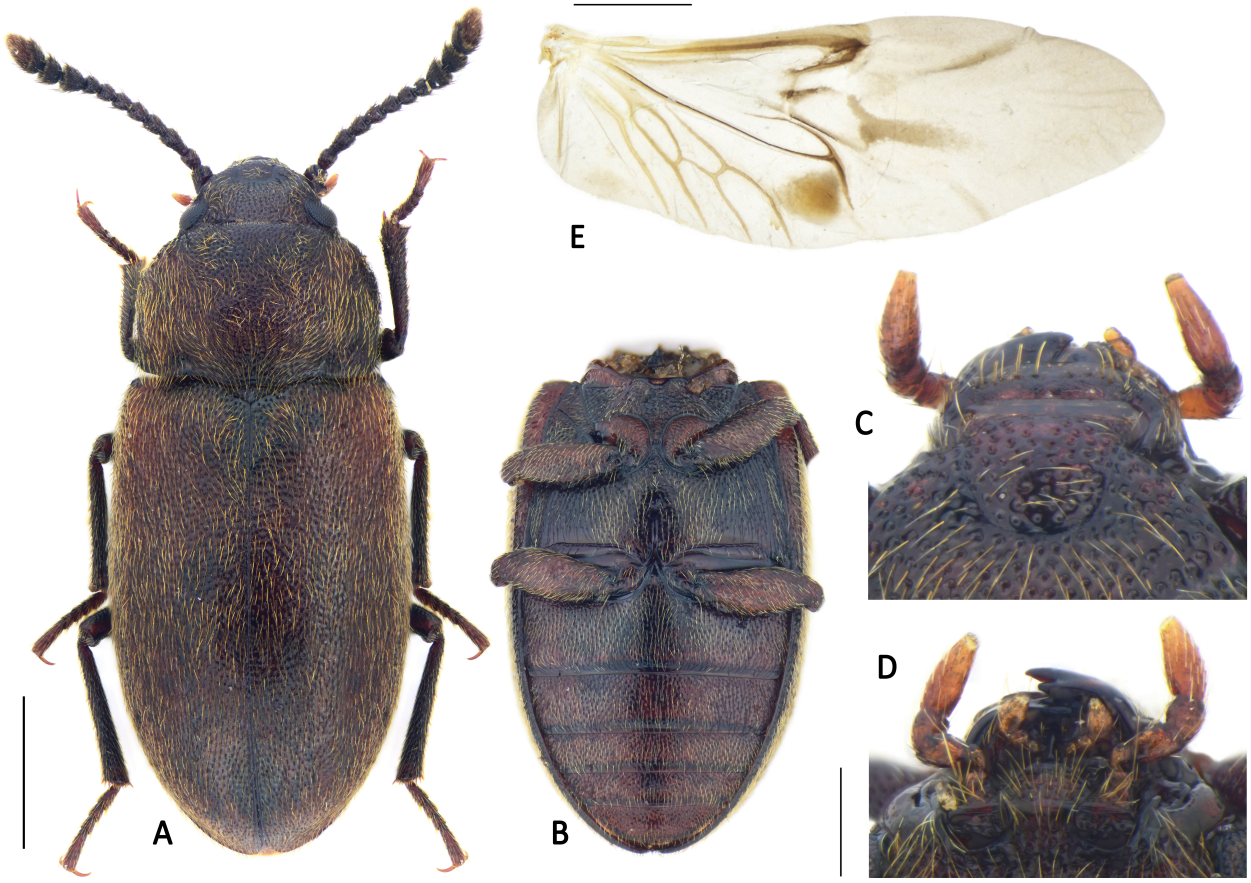

FIGURE 1. *Pisenus qizai* **sp. nov.**: **A** habitus **B** ventral surface of pterothorax and abdomen **C** mouthparts, dorsal view **D** mouthparts, ventral view **E** hind wing. Scale bars = 1.0 mm for figs A, B, E; = 0.2 mm for figs C, D.

FIGURE 2. *Pisenus qizai* **sp. nov.**: **A–C** antenna **A** anterior view **B** dorsal view **C** anterior view of apical four antennomeres **D** protarsus **E** mesotarsus **F** metatarsus. Scale bars = 0.2 mm.

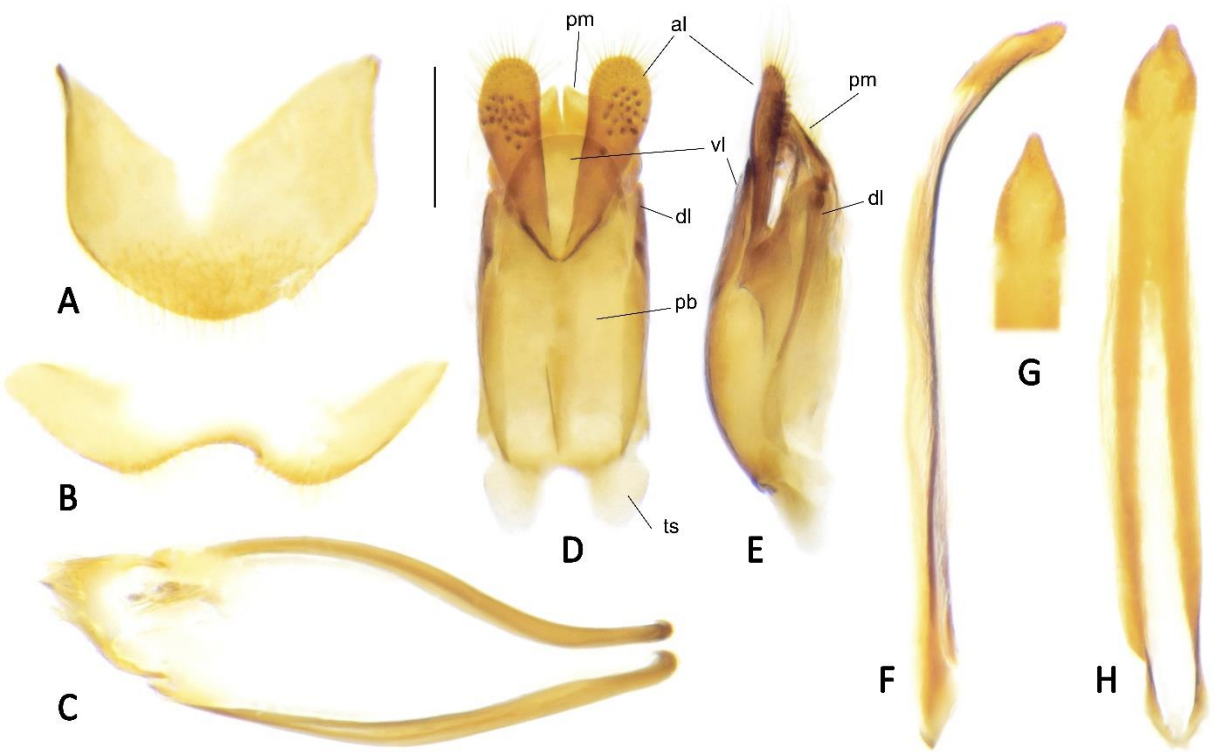

FIGURE 3. Male terminalia of *Pisenus qizai* **sp. nov.**: **A** tergite VIII **B** sternite VIII **C** abdominal segment IX **D** tegmen, ventral view **E** tegmen, lateral view **F** penis, lateral view **G** penis apex **H** penis, ventral view. Scale bar = 0.2 mm, for all figures. Abbreviations: **pm** parameres **al** accessory lobes **dl** dorsolateral lobes **vl** ventral lobe **pb** phallobase **ts** tegminal struts.

Etymology. The specific epithet *qizai* is derived from Qizai, the name of the only captive brown giant panda. The new species was collected in a locality very near to Sanguanmiao, within Foping National Nature Reserve, where Qizai was first discovered in 2009. This name also alludes to the brownish coloration of the beetle, which resembles that of Qizai, the brown panda.

Habitat. All specimens of *P. qizai* **sp. nov.** were found associated with a small-sized (diameter of fruit bodies ca. 3–6 cm) polypore fungus identified as *Trametes* sp. (Fig. 8A). All specimens were collected from a single piece of deadwood, where both the fungus and the deadwood were extremely dry. Most adults of *P. qizai* **sp. nov.** were discovered under the bark, close to the fruiting bodies of host fungus.

Distribution. Only known from the type locality (Foping) in the Qinling Mountain Range in Shaanxi Province.

Pisenus atrox sp. nov. 黑魔皮蕈甲

https://zoobank.org/90C8C5C1-8442-49D5-8318-E6965F4BD583

Figs 4A–D, 5–7

Type material. Holotype ♂, "Sichuan, Aba pref., Maoxian county, Jiudingshan, mixed forest, 3210 m, N31.5127, E103.7536"; "In rotten *Trametes* fungi on dead wood; 2025.V.24; SHI H.L. lgt.". **Paratypes** (a total of 203 exx.) 75 ♂♀, same data as holotype. 107 ♂♀, same data as holotype but date 2025.V.25. 10 ♂♀ and 4 larvae, preserved in alcohol, same data as holotype but date 2025.V.25. 4 ♂♂, 3 ♀♀, "Sichuan, Mianyang city, Pingwu county, Shajigou, mixed forest; 2446 m, N32.8263, E104.1633"; "In fungi on dead wood; 2025.VI.06; Shi H.L., Li T., Chen J.H., & Wu Z.Y. lgt.".

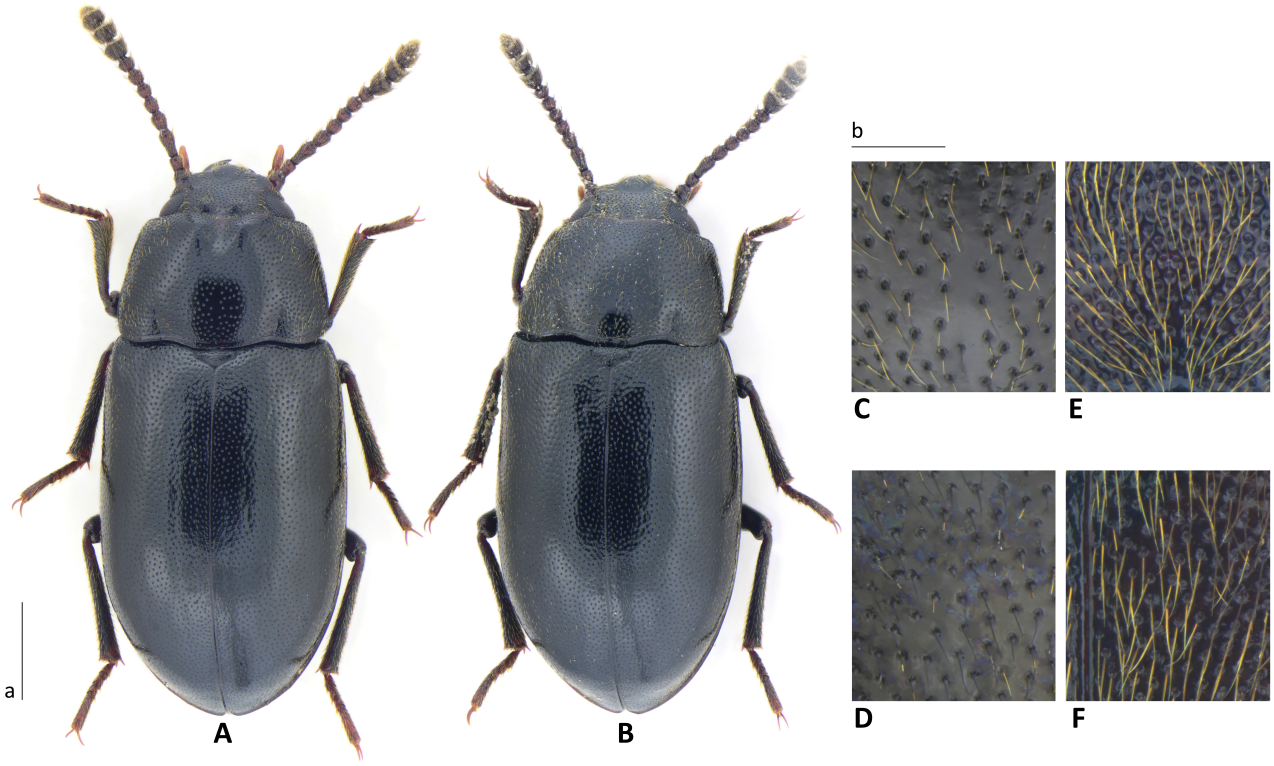

FIGURE 4. A–B Habitus of *Pisenus atrox* **sp. nov. A** male **B** female **C–F** punctation and pubescence of *Pisenus* spp. **C** *P. atrox* **sp. nov.**, medial-posterior region of pronotum **D** *P. atrox* **sp. nov.**, basal region of elytron **E** *P. qizai* **sp. nov.**, medial-posterior region of pronotum **F** *P. qizai* **sp. nov.**, basal region of elytron. Scale bars: a = 1.0 mm, for figs A, B; b = 0.2 mm, for figs C–F.

Diagnostic characters. Largest species in *Pisenus*, BL = 5.0–6.2 mm; dorsum entirely black, covered with very short decumbent pubescence; distinct sexual dimorphism present (Fig. 4): males with a pair of faint tubercles on vertex, and pronotum slightly protuberant medially, forming a pair of faint projections; females with unmodified vertex and pronotum; antennae slightly exceeding base of pronotum, A5–A8 moniliform, length not exceeding their width; tegmen with large accessory lobes, approximately half length of tegmen, each accessory lobe with 8–10 tubercles; penis about 1.2 times as long as tegmen, apex capitate.

Comparison. The new species is distinctive within the genus by its notably large body size (BL = 5.0–6.2 mm) and the presence of sexual dimorphic characters on the vertex and pronotum. In all other congeners, the body length is consistently less than 5.0 mm, and no external sexual dimorphism is observed.

Among the six known Asian species of the genus, *Pisenus atrox* **sp. nov.** is most similar to *P. rufitarsis* (Reitter), sharing the diagnostic characters of a uniformly black dorsum and the penis that is slightly longer than the tegmen (1.2–1.3 times of the length of the latter) and furnished with a capitate apex. Beyond the striking differences in body size and sexual dimorphism noted above, these two species can be further distinguished by the followings: (1) The antennae are longer in *P. rufitarsis*, with at least the three apical antennomeres extending beyond pronotal base; A4–A8 are each longer than wide. In contrast, the antennae of *P. atrox* **sp. nov.** are shorter (consistent with other Asian congeners), with only one or two apical antennomeres surpassing the pronotal base; A5–A8 are moniliform, with their length not exceeding their width. (2) In *P. atrox* **sp. nov.**, the dorsolateral lobes of the phallobase are conspicuously projected toward the parameres. (3) In *P. atrox* **sp. nov.**, the penis apex is narrower, bearing a significantly smaller arrow-shaped apical capitulum.

In comparison with *P. qizai* **sp. nov.**, another new species described above, *P. atrox* **sp. nov.** differs in several key morphological aspects, including: a larger body size; much finer and sparser dorsal punctures; significantly finer and shorter dorsal pubescence; the presence of sexual dimorphic characters; A5 with its length not exceeding

its width; main bodies of the tegminal accessory lobes being laterally parallel; and a shorter penis with a capitate apex.

Another species, *Allenus anthracinus* Háva & Alekseev, 2024, was recently described from Vietnam. Although it was assigned to a distinct genus, this Vietnamese species shares marked similarities with *Pisenus atrox* **sp. nov.**, not only in body coloration but also in the presence of similar sexual dimorphic characters on pronotum. *Allenus anthracinus* can be readily distinguished from the new species by the following characters: males lack a pair of vertex tubercles, and pronotal protuberances considerably fainter; antennae notably more elongate, with a distinctly loose antennal club—even longer than those of *P. rufitarsis*; and pronotum with much coarser punctures. As indicated in the original description (Háva & Alekseev 2024), the genus *Allenus* was established primarily on the basis of its differences from *Pisenus*, namely the more elongate antennae with a loose apical club and the modifications of the pronotum. However, given that the antennal morphology of *Allenus* is analogous to that of *P. rufitarsis* (although more pronounced), and the pronotal modifications of *Allenus* mirror those of *P. atrox* **sp. nov.** (although less prominent), we suspect that these three species are actually closely related, and that *Allenus* is likely merely a junior synonym of *Pisenus*. Because the male genitalia of *Allenus anthracinus* were not very clearly illustrated in the original publication, the taxonomic status of *Allenus* remains ambiguous, and we refrain from proposing its synonymization herein.

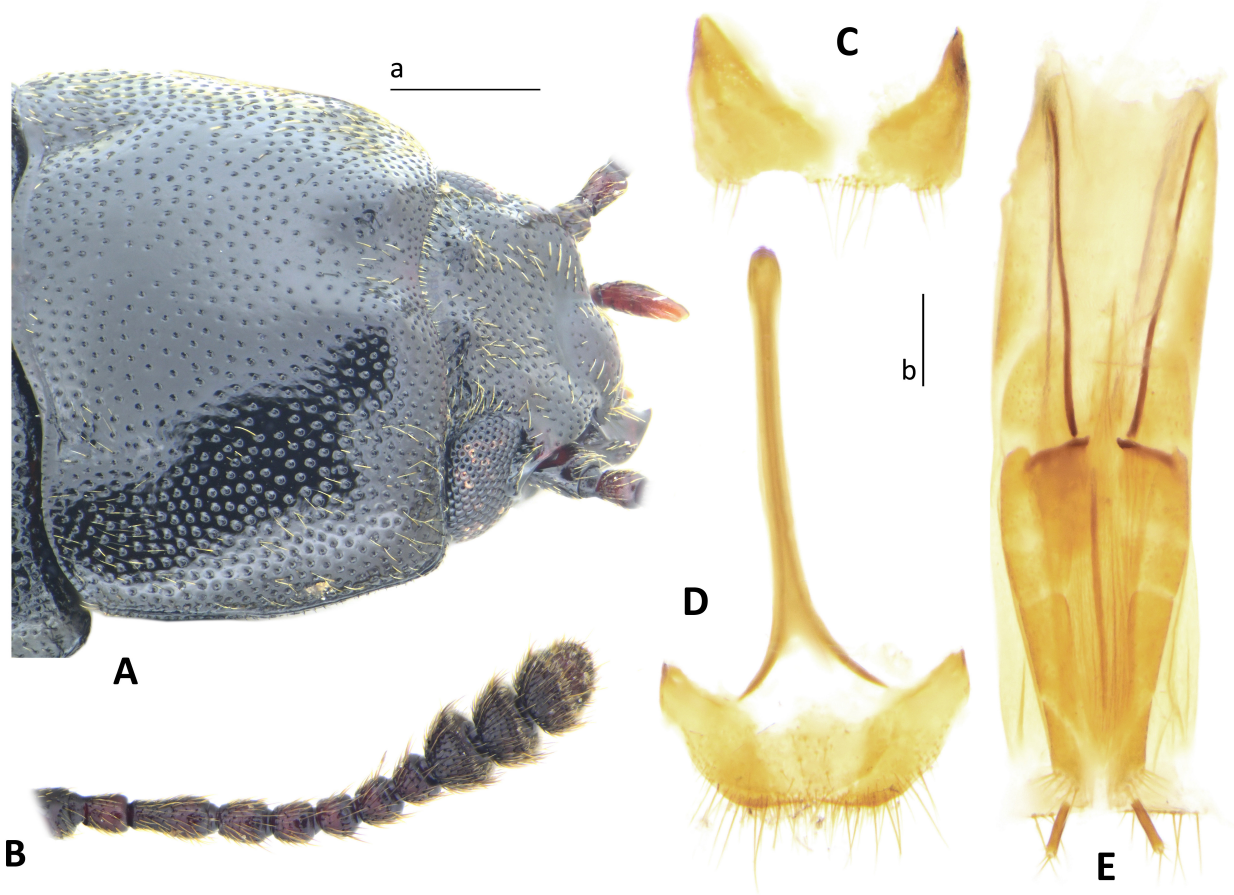

FIGURE 5. *Pisenus atrox* **sp. nov.**: **A** dorsal-lateral view of head and pronotum, male **B** antenna **C** female tergite VIII **D** female sternite VIII **E** ovipositor. Scale bars: a = 0.5 mm, for figs A, B; b = 0.2 mm, for figs C, D, E.

Description. BL = 5.0–6.2 mm (males 5.0–5.7 mm, females 5.0–6.2 mm), elytra slightly convex, head and pronotum with sexual dimorphism (Fig. 4A, B). Dorsum entirely black, with distinct luster; antennae and tarsi very dark brown; palpomeres reddish brown; ventral surface entirely black. Dorsum finely and densely punctate, punctures sparser on middle region of pronotum (Fig. 4C), nearly equally distributed on elytra, gradually turn to very fine punctures on elytral apex; on basal portion of elytra, average distance between punctures 1.5–2.0 times

diameter of punctures (Fig. 4D). Each puncture bearing a very short, fine golden pubescence, which partly or completely abraded in most of the examined specimens; in fresh specimens with entire pubescence, pubescence decumbent, longer on head and lateral area of pronotum, very short on most part of elytra, length of pubescence about same as distance between punctures (Fig. 4C, D).

Head relatively small, much narrower than pronotum, HW/PW = 0.64–0.68. Eyes flat kidney-shaped, emarginate behind antennal insertion, coarsely faceted; fronto-clypeal suture almost semicircular, distinctly impressed; vertex with a pair of faint tubercles in males (Fig. 5A), without such tubercles in females. Antennae relatively short, apical one or two antennomeres exceeding pronotal posterior margin, apical three antennomeres strongly dilated, forming loose club; A4 slightly longer than A2, slightly longer than its width; A3 about 1.8 times as long as A2; A5–A8 globular, not longer than width; A9 and A10 hemispherical, A10 slightly shorter than A9, apical surface of both antennomeres hairy and forming a sensilla region; A11 oblate spheroid, with wide apical sensilla region (Fig. 5B).

Pronotum nearly trapezoidal, PW/PL = 1.57–1.64; anterior margin shallowly but distinctly emarginate at middle; lateral margins nearly straight, widest point behind middle, usually very close to posterior angles; anterior angles wide, not projected at all; posterior angles widely rounded; posterior margin strongly bisinuate, distinctly bordered between two latero-basal depressions; latero-basal depressions shallow but distinct, forming oblique short sulci. In males, anterior region of pronotum slightly concave at middle, with a pair of faint projections aside concavity; females without these projections and concavity.

Elytra relatively short, EL/EW = 1.41–1.47, lateral margins nearly parallel, widest a little behind mid-point. Ventral surface densely punctate, pubescence relatively long on prosternum; other parts of ventral side and legs similar to the previous species.

Male terminalia (Fig. 6): sternite VIII shallowly emarginate apically; tergite VIII rounded apically. Tegmen short and wide; parameres apically setose, articulated to phallobase, very short and wide, about one-third length of phallobase, partly fused to each, distinctly notched between two parameres; main body of phallobase sheath-shaped, posterior (apical) edge lobed, with a large lingulate ventral lobe and a pair of distinctly projected dorsolateral lobes; a pair of accessory lobes inserted basally to dorsal surface of ventral lobe; accessory lobes large and wide, nearly twice length of parameres, approximately 0.45 times as long as tegmen, apex widely rounded, with very long setae, lateral margins subparallel at apical half, dorsal surface of accessory lobes with 8–10 stout tubercles (Fig. 6D). Penis approximately 1.2 times as long as tegmen, apical third bent to dorsum; apex capitate, small and arrow-shaped (Fig. 6G).

Female terminalia: Sternite VIII with long and thick spiculum ventrale (Fig. 5D); ovipositor moderately elongate, gonocoxites fused, in similar length as the paired basal baculum; gonostylus palpiform, setose apically (Fig. 5E).

Larvae. Four larvae were collected together with a large number of adults in Maoxian, Sichuan Province. They conform well to the typical morphology of the genus *Pisenus* (Hayashi 1972; Lawrence 1991). Larvae of three *Pisenus* species have been previously recorded and diagnosed (Hayashi 1972; Nikitsky 1998). The larva of *P. atrox* **sp. nov.** is very similar to *P. rufitarsis* according to the description provided by Hayashi (1972), but different in the following aspects:

General habitus as in Fig. 7; body length ca. 6.2 mm; head capsule ca. 1.2 mm in width. Antennae 3-segmented, A1 strongly transverse, much shorter than A2, A3 subequal in length to A2; sensory appendage on A2 small and cone-shaped, less than a third length of A3. Abdominal segment IX with four dorsal tubercles, median pair subequal in size to lateral pair; urogomphi strongly curved and upwardly hooked, with a pair of caudal tubercles near base, elongate and sharp, projecting dorsally, far separated from each other.

Etymology. The specific epithet *atrox* is derived from Latin, meaning dark and horrible. This name refers to the black body coloration of the new species, as well as to its large body size and striking sexual features on the head and pronotum.

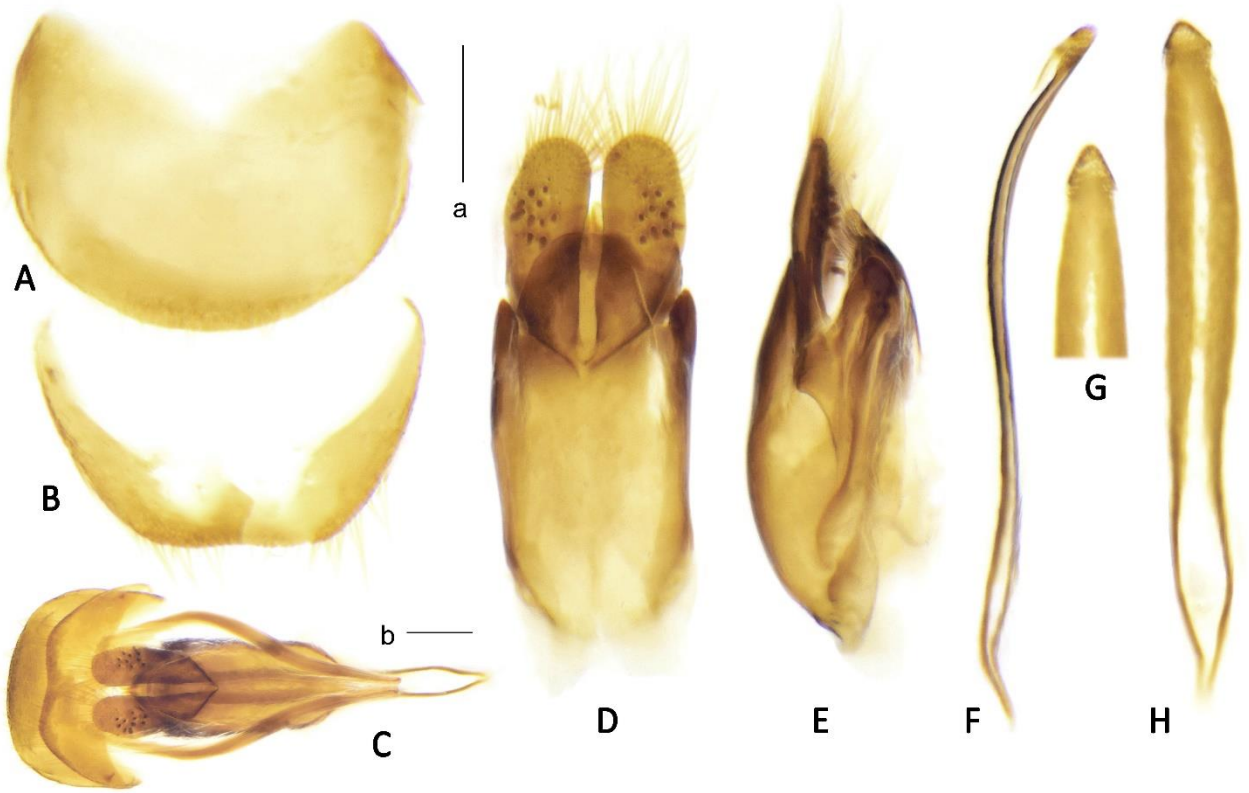

FIGURE 6. Male terminalia of *Pisenus atrox* **sp. nov.** (holotype for figs A, B, D–G): **A** tergite VIII **B** sternite VIII **C** genital complex and abdominal segments VIII–IX **D** tegmen, ventral view **E** tegmen, lateral view **F** penis, lateral view **G** penis apex **H** penis, ventral view. Scale bars = 0.2 mm: a for figs A, B, D–G; b for fig C.

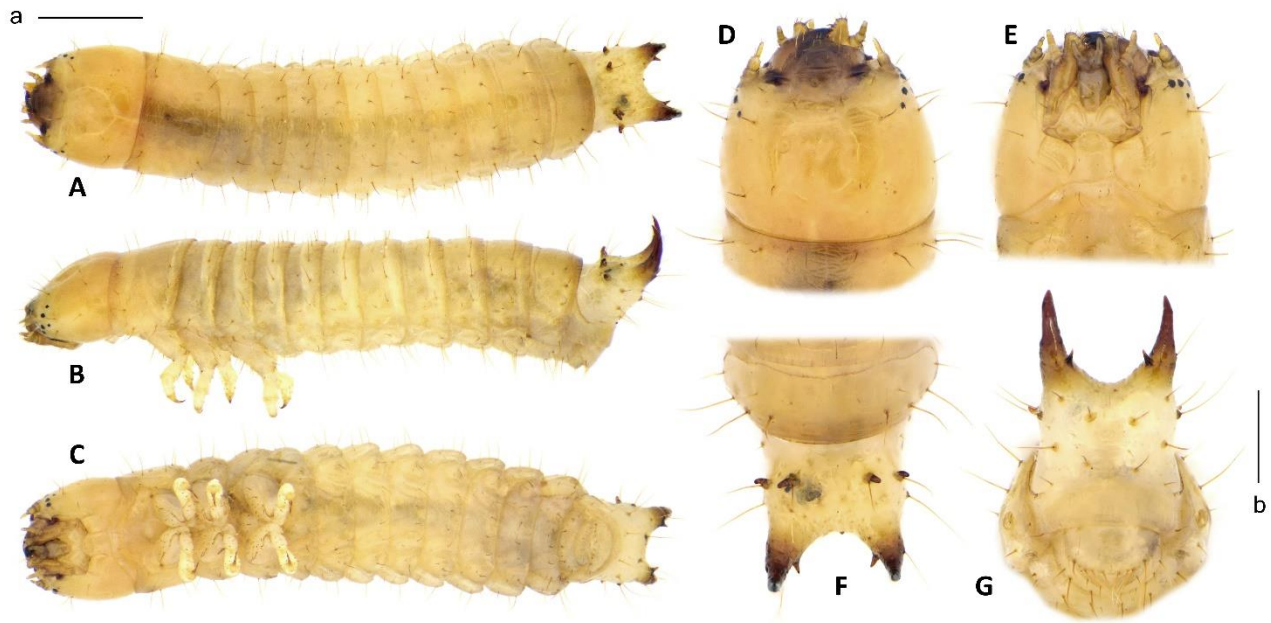

FIGURE 7. Larva of *Pisenus atrox* **sp. nov.**: **A** dorsal view **B** lateral view **C** ventral view **D** head, dorsal view **E** head, ventral view **F** abdominal apex, dorsal view **G** abdominal apex, ventral-apical view. Scale bars: a = 1.0 mm, for figs A, B, C; b = 0.5 mm, for figs D, E, F, G.

Habitat. All specimens were collected inside the fruiting bodies of a large-sized (diameter ca. 15–25 cm) polypore fungus identified as *Trametes* sp. (Fig. 8B). Both adults and larvae bore into the lower surface of the fungal fruiting bodies, excavating cavities with distinct openings on small tubercles (Fig. 8C). They tend to prefer moist and moderately decomposed fungal substrates. In optimal host fungi, aggregations of several tens of adult individuals may be observed (Fig. 8D).

Distribution. Sichuan Province (Maoxian, Pingwu). Only known from two localities in the Minshan Mountain Range in the northern part of Sichuan Province. The line distance between these two localities is about 150 km.

FIGURE 8. Habitat of *Pisenus* species: **A** Habitat and host fungus (*Trametes* sp.) of *P. qizai* **sp. nov.** in Foping, Shaanxi Province; all the type series were collected from this dead wood **B** Habitat and host fungus (*Trametes* sp.) of *P. atrox* **sp. nov.** in Maoxian, Sichuan Province **C** Lower surface of an infested fungal fruiting bodies, showing the excavations made by *P. atrox* **sp. nov. D** Split host fungus, with over thirty adults of *P. atrox* **sp. nov.** sifted from the fungus and placed on the tray.

Pisenus chujoi Miyatake, 1960

Pisenus chujoi Miyatake, 1960: 129; Li 1992: 145; Nikitsky 1998: 28; Jung 2011: 125; Li *et al*. 2015: 184; Jung 2019: 52.

Pisenus chujoi was first recorded from China in a checklist (Li 1992), with no examined specimen cited and only briefly mentioning its occurrence in Liaoning Province. Subsequently, the same author provided a figure of habitus of this species and listed its distribution as Liaoning, Korea, and the Russian Far East (Li *et al*. 2015). Whereas, most illustrations for the Tenebrionoidea taxa in Li *et al*. (2015) were reproduced from various online resources, including the image of *P. chujoi*, which has been confirmed to be identical to a photograph sourced from the zin.ru website. Furthermore, the occurrence of *Pisenus chujoi* in Korea is also regarded as questionable (Jung

2011; 2019). We therefore conclude that the previous record of *P. chujoi* from China is unreliable, and this species is likely not distributed in either China or Korea.

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